

*Aphodius analis* and its allies  
in the subgenus *Teuchestes*,  
with descriptions of two new species  
(Coleoptera Scarabaeidae: Aphodiinae)

by

Giovanni DELLACASA \* and Colin JOHNSON \*\*

With 48 figures

ABSTRACT

A critical study of an abundant material of *Aphodius analis* has revealed that there are in fact four quite distinct species two of them being new to science: *A. sinofraternus* from China and *A. whitheri* from Rhodesia. The study of the epipharynx and aedeagus confirms the homogeneity of the subgenus *Teuchestes* sensu DELLACASA (1983) comprising actually the type species *A. fossor* and six more species.

*Aphodius analis*, perhaps better known as *sorex*, has always been considered a species having a wide distribution embracing South Africa, Ethiopia, India, Central and Southern China, Taiwan, Indo-China and Australia (BALTHASAR 1964: 38). A critical study of material from most of these diverse countries has revealed that there are in fact four quite distinct species which have been confounded. At least three of them are polymorphic with respect to elytral colour and none has a range as wide as that previously thought.

Bengt-Olof LANDIN has published (1974) a paper on African *Coloboapterus*. On pages 236-7 he deals with the *analis* problem and recognises two subspecies, the oriental *analis analis*, and *analis caffer* from Africa, basing this separation on differences in the male hind tibiae. LANDIN, having not found other constant distinctions, rejected a former subspecific arrangement based on colour only.

---

\* c/o Museo Civico di Storia Naturale "Giacomo Doria", Via Brigata Liguria 9, I-16121 Genova, Italia.

\*\* Dept. of Entomology, Manchester Museum, The University, Manchester M13 9PL, England.

Our observations confirm LANDIN's views with respect to these two characters, but they have also revealed additional and apparently constant characters in the shape of the head, length of the front border of the pronotum, form of the male fore-tibial spur, and the length of the upper hind tibial spur in relation to the tarsal segments. Such differential characters are confirmed by differences in the aedeagus and epipharynx as well.

The recognition of two additional new taxa, *sinofraternus* and *whichei*, involves, we feel, difficulties in considering  *analis* and *caffer* as subspecies, since logically the new ones should have been assigned a subspecific rank. Yet zoogeographically, such a position is difficult to maintain on the scanty evidence available. Both  *analis* and *sinofraternus* occur in Eastern Asia (China) and have been taken in the same localities, whilst both *caffer* and *whichei* occur in Southern Africa, although no known locality is shared by the last two species.

On the basis of male secondary sexual characters, these four taxa fall into two species-pairs: *caffer/whichei* and  *analis/sinofraternus*. It seems to us that taking all these factors into consideration, the taxa in question are best treated at the specific, rather than subspecific, level. This does not, however, deny their obvious intimate inter-relationship, nor their descent from a common ancestral species, but rather recognises that through isolation and variation they have evolved to the species rank. It would naturally be of considerable interest to attempt cross-pairing of the taxa in order to ascertain whether they behave as species or subspecies. Landin gives additional distributional data which shows *caffer* to be widespread in Eastern and Southern Africa. *Aphodius dejeani* is also briefly mentioned and one specimen is recorded from Ethiopia.

The question of the status of *Coloboferus* is highly problematical as different people feel that emphasis needs to be placed upon different features. The structure of the scutellum is a particularly important one and this character tends to be used fairly extensively in generic classification elsewhere in the Coleoptera. Nevertheless we do not follow herewith the opinion of some modern authors which treat *Coloboferus* at the generic level because this includes several heterogenous subgenera (e.g. *Teuchestes*) which share a large scutellum.

The subgenus *Teuchestes* (type species: *fossor* (Linn.), by monotypy) is here considered in the restrictive sense as established by one of us (DELLACASA 1983; i.e. *Aphodius haemorrhoidalis* (Linn.) is assigned to the separate subgenus *Otophorus*). Its epipharynx (generalized scheme fig. 6) is characterized by a belt of haired lobes along the front margin; epitorma faint towards corypha; the latter triangularly widened forward and with short spinulae arranged longitudinally; chaetopariae thick and rather elongate.

As far as we know, four other species are listed in the subgenus *Teuchestes* (in addition to the seven dealt herewith), whose taxonomic status and subgeneric position are still uncertain, i.e.:

- 1) *Aphodius donghariensis* Stebnicka, 1973, from Korea. According to NIKOLAJEV (1979), this species is a junior synonym of *Aphodius* (? *Diapterna*) *troitzkyi* Jacobson, 1897, (female).
- 2) *Aphodius parabrachysomus* Balthasar, 1955, from Afghanistan.
- 3) *Aphodius schirparakensis* Petrovitz, 1955, from Afghanistan. BALTHASAR supposed this species to be a form of his *parabrachysomus*.
- 4) *Aphodius schulzeae* Endrödi, 1976, from Kenya.

The present paper is primarily based on material in the Manchester Museum (MM) and British Museum (Nat. Hist.) (BM). For the opportunity to study material in the

latter Institution and for the loan of specimens, thanks are due to R.D. Pope and M.E. Bacchus. We are also indebted to the following colleagues for the loan of important types and various material: A. Møller, Zoological Museum, Copenhagen; R. Poggi, Museo Civico di Storia Naturale, Genova (MG); I. Löbl, Muséum d'Histoire Naturelle, Genève (MGE); N. Berti and Y. Cambefort, Muséum National d'Histoire Naturelle, Paris (PM); G. Scherer, Zoologische Staatssammlung, München (ZS); F. Hieke and M. Uhlig, Museum für Naturkunde, Berlin (MN); J. Decelle, Musée Royal de l'Afrique Centrale, Tervuren (MR).

The localities of specimens which we have studied are listed under the heading 'Confirmed Distribution'.

## KEY TO SPECIES

1. — Front margin of pronotum almost completely bordered, the border absent only at the middle; clypeus strongly sinuate at the middle; base of pronotum not bordered, with a feebly developed belt of coarse punctures only; male: hind tibiae fig. 11, fore-tibial spur fig. 4. Southern & Eastern Asia. . . . . *analis*
- 1'. — Front margin of pronotum not bordered, at the most with a border from the front angles to the middle of the eye level . . . . . 2
2. — Base of pronotum completely bordered, at the most the border absent adjacent to the scutellum . . . . . 3
- 2'. — Base of pronotum not bordered, although with a belt of coarse punctures of variable shape, especially at sides . . . . . 6
3. — Scutellum distinctly concave or grooved . . . . . 4
- 3'. — Scutellum almost flat . . . . . 5
4. — Scutellum evenly concave; base of pronotum uniformly bordered; side-borders of pronotum distinct from above, these and the elytral ones rather broad; head large. Eastern Asia . . . . . *brachysomus*
- 4'. — Scutellum with a deep and narrow median groove along its entire length; side-borders of pronotum hardly distinct from above, these and the elytral ones narrow; head small. Southern, Eastern & North Eastern Africa. . . . . *dejeani*
5. — Pronotum at base without a border adjacent to the scutellum, disc sparsely punctured; scutellum entirely punctured; clypeus distinctly sinuate at middle; male: hind tibiae slightly widened apically fig. 8, fore-tibial spur fig. 2. Southern Africa . . . . . *whichei*
- 5'. — Pronotum at base completely bordered, without puncturation on disc; scutellum almost impunctate; clypeus feebly sinuate at middle. Holarctic region . . . . . (*fossor*) \*
6. — Elytral interstices convex; striae distinctly crenulate; clypeus feebly sinuate at middle; male: hind tibiae fig. 10, fore-tibial spur fig. 3. Eastern Asia . . . . . *sinofraternus*
- 6'. — Elytral interstices rather flat; striae hardly crenulate; clypeus rather distinctly sinuate at middle; male: hind tibiae fig. 9, fore-tibial spur fig. 1. Southern, Eastern & North-Eastern Africa . . . . . *caffer*

\* Included in the key for completeness. Not dealt with in the present work.

**Aphodius analis** (Fabr.) (figs. 4, 11, 30-35)1787. *Scarabaeus analis* Fabricius, *Mant. Ins.* 1: 181792. *Scarabaeus sorex* Fabricius, *Ent. Syst.* 1: 23

Locus typicus: India orientalis.

*Valde convexus, breviter ovatus, modice nitidus, glaber. Niger; saepe elytris macula magna apicis ferruginea, interdum elytris omnino ferrugineis margine tamen ipso tenuissime nigro, vel omnino nigris. Capite clypeo medio valde sinuato; pronoto antice fere omnino marginato, tantum in medio mutico; basi haud marginato, tantum serie transversa punctuorum contiguorum instructo; maris tibiis anticis calcari valde dilatato et deorsum incurvato; tibiis posticis compressis, apice valdissime dilatatis.*

Head convex with fine, irregular and scattered puncturation, laterally coarser but more confused; clypeus strongly sinuate at middle, rather angulate at sides, front margin broad and upturned; genae obtusely angulate, more strongly protruding beyond eyes; epistome gibbose; frontal suture distinct towards the sides only; frons tuberculate. Pronotum strongly convex, rather broad, sparsely punctured, largest punctures irregularly arranged, mixed with extremely thick punctures; without microreticulation; front margin bordered except at its middle; sides feebly bordered, deeply sinuate up to the hind angles; the latter obtuse and quite sharp; base not bordered, with a moderately extended belt of coarse punctures. Scutellum large, rather flat, with sides almost parallel at the basal half, moderately but distinctly punctate, finely microreticulate. Elytra strongly convex, regularly rounded at sides, not very shining; striae feebly impressed and feebly crenulated; interstices nearly flat with extremely fine punctures, finely but distinctly microreticulate. Hind tibial upper spur as long as, or slightly longer than the first segment of the metatarsi, which is as long as the next three segments together. Male: frons trituberculate, median tubercle conical and prominent, placed near the curve of the epistomal carina and anterior to the lateral ones which are rather transverse; pronotum feebly impressed anteriorly at middle; fore-tibial spur extremely broad and strongly curved inwards, basally narrowed (fig. 4); hind tibiae flattened, remarkably enlarged at their apical half, their outer face prolonged rearwards, its subapical groove straight (fig. 11). Female: frons with weaker transverse tubercles, the median one more conical; epistomal carina faint; pronotum not impressed at middle; fore-tibial spur narrow and subparallel; hind tibiae neither flattened, enlarged nor expanded. Aedeagus figs.: 32-33. Epipharynx fig. 31. Length: 7-10 mm.

The species is known from India, Indochina, China and Japan.

*Colour variations*

*forma typica*: black, elytra with almost the apical half reddish except for the margin and the first interstice (fig. 34).

*sorex* Fabr. (*beckeri* Mad.): elytra reddish, narrowly margined with black all round; epipleura and scutellum also black (fig. 35).

*niger* Landin: entirely black.

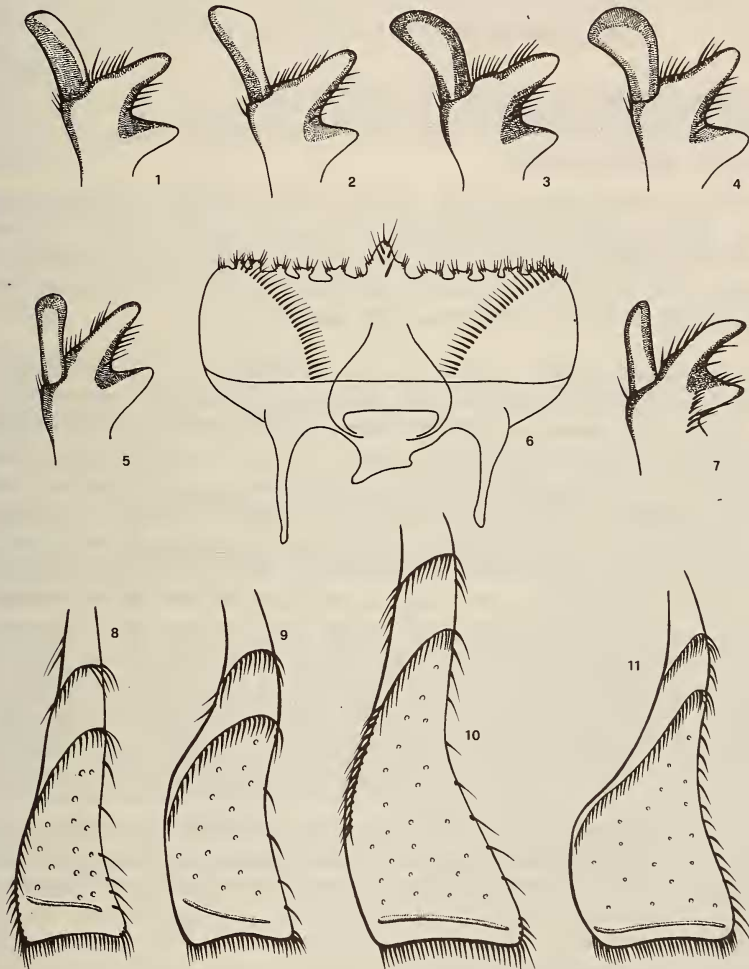
*Type material*

One of us (Johnson) studied the lectotypes (Landin 1956) of both *analis* and *sorex* as well as other specimens from the Fabrician collection in Copenhagen, thus the inter-

pretation of these names is definite. According to Mader's description, *ab. beckeri* seems to belong in *analis* *ab. sorex*.

*Confirmed Distribution \**

CHINA: Hong Kong (BM, MM, MP, ZS, MGE); Canton (MP); Yangtze (BM); Danes Is., Canton River (BM); Pin-Fa, Gan-Chouen-Fou, Kout-Tchéou (MP); Fri-Gien, Yunnan (MP).



FIGS. 1-11.

Male fore-tibial spur: *caffer* Fig. 1; *whichei* Fig. 2; *sinofraternus* Fig. 3; *analis* Fig. 4; *brachysomus* Fig. 5; *dejeani* Fig. 7. Generalized scheme of epipharynx: *fossor* Fig. 6. Outer face of male hind tibiae: *whichei* Fig. 8; *caffer* Fig. 9; *sinofraternus* Fig. 10; *analis* Fig. 11.

\* The geographical names have not been modernized but are cited from the locality labels.

JAPAN: No precise locality, leg. G. Lewis (BM).

VIETNAM: Hoa-Binh, Than-Moi, Ma-Cham, Lao-Kay, Chapa, Backan, Hanoi, Tuyen-Quan, Yen-Bai, H'oa-Giang, Cho-Ganh (MP); Lang-Son, Thin-Ho (MGE).

LAOS: Luang-Prabang, Ban-Thao-Phan, Xien-Khouang, Muong-Sing, Bian-Sui (BM); Ban-Sai, Muong-Pek, Ban-Na-Ban (MP, BM).

INDIA: Manipur, Shugnu (BM); Nurbong, Darjeeling (BM, MM); Pedong, Trichinopoly (MP).

### *Aphodius brachysomus* Solsky (Figs. 5, 12-23)

1874. *Aphodius brachysomus* Solsky, *Col. Hefte* 12: 13

1875. *Aphodius major* Waterhouse, *Trans. ent. Soc. Lond.* 80

Locus typicus: Siberie orientale.

*Valde convexus, breviter ovatus, nitidus, glaber. Niger, interdum elytris flavo maculatis. Capite clypeo margine reflexo, medio vix sinuato; sutura frontali trituberculata; pronoto inaequaliter sparse punctato, antice haud marginato, angulis posticis obtuse truncatis, basi lateribusque omnino valde marginato; scutello profunde impresso; elytris crenato-striatis, interstitiis convexis, laevibus.*

Head moderately convex, with rather fine, irregular and scattered puncturation; clypeus very feebly sinuate at middle, rounded at each side, the front margin narrow but distinct, slightly but evenly upturned; genae rounded, more protruding than eyes; epistome gibbose; frontal suture trituberculate. Pronotum strongly convex, broad and microreticulate, with irregularly scattered puncturation; front margin not bordered; sides strongly sinuate up to the hind angles, these obtusely rounded; base bisinuate, its margin completely and evenly bordered, without a puncture belt. Scutellum very large, sides almost parallel in the basal half, microreticulate, with fine and sparse puncturation, strongly concave. Elytra short, very convex, broadened behind, rather shining; striae rather closely and conspicuously punctured, rather distinctly crenulate; interstices nearly flat and very finely microreticulate. Upper spur of hind tibiae shorter than the first segment of the metatarsi which is longer than the next three segments together. Male: frontal suture strongly tuberculate, the median tubercle large and conical, the lateral ones smaller; epistomal transverse carina much evident; pronotum very sparsely punctured, with distinct anterior impression at middle; fore-tibial spur almost parallel-sided, apically subtruncate (fig. 5). Female: frontal suture with all tubercles weaker; pronotum relatively less sparsely punctured, without an anterior impression at middle; fore-tibial spur apically narrowed. Aedeagus figs.: 14-15. Epipharynx fig.: 13. Length: 7-10 mm.

The species is known from East Siberia, Japan, Korea and Central-Eastern China.

#### *Colour variations*

*Forma typica*: entirely black (fig. 16).

*unimaculatus* Dellacasa, ab. nov.: Elytra preapically with one small yellowish irregular mark on the second interstice (fig. 17).

*bimaculatus* Dellacasa, ab. nov.: like *unimaculatus* but with a second mark on the seventh interstice near shoulder (fig. 18).

*trimaculatus* Dellacasa, ab. nov.: *do.*, but with a third mark on the fifth interstice near apex (fig. 19).

*quadrinaculatus* Dellacasa, ab. nov.: *do.*, but with a fourth mark on the third interstice near apex (fig. 20).

*quinquemaculatus* A. Schmidt: *do.*, but with a fifth mark on the ninth interstice below shoulder (fig. 21).

*quadrinaculatus* Dellacasa ab. nov.: like *trimaculatus* but with a transverse mark very close to apex, broadened on fifth, sixth and seventh interstices (fig. 22).

*latebimaculatus* Dellacasa, ab. nov.: Elytra with a large subapical yellowish spot irregularly sinuate anteriorly, and with a mark of the same colour on the seventh interstice near shoulder (fig. 23).

#### *Type material*

One of us (Johnson) has studied Waterhouse's type of *major* from Hiogo, Japan, in the British Museum, and confirms the validity of the synonymy *major* Wat. = *brachysomus* Solsky.

#### *Confirmed Distribution*

U.S.S.R.: Ussurisk (MM, MG); Nikolsk (MG); Wladiwostok (MG); Chanka (MG, ZS); Amur (MG, ZS); Ile Popof (MP); Sotka Goia (MP).

CHINA: Ningpo (BM); Ctzachouw, Cthen Kians (MN).

KOREA: Chemulpe (MN); Seoul (MP).

JAPAN: Yokohama (BM); Kyushu, Mt Unzen (BM); Ile d'Oshima, Aoni Aomoni (MP); Yezo (MG); Hiogo (BM: *major* holotype)

#### *Aphodius caffer* Wied. (figs. 1, 9, 36-40)

1823. *Aphodius caffer* Wiedemann, *Zool. Magazin, Kiel*, 2: 25.

Locus typicus: "Prom. bon. sp."

*Valde convexus, brevis, modice nitidus, glaber. Niger, interdum elytris omnino ferrugineis tantum margine tenuiter nigris. Capite clypeo medio distincte sinuato, lateribus subanguloso; pronoto antice basique haud marginato, serie basali transversa punctuorum contiguorum tantum instructo; elytris fere punctato-striatis, interstitiis planiusculis; maris tibiis anticis calcari haud deorsum incurvato, haud dilatato, vix tantum torto et tibiis posticis compressis, apice modice dilatatis.*

Head convex, with rather fine and scattered puncturation; clypeus markedly sinuate at middle, subangulate at sides, completely and strongly bordered, the border distinctly upturned; genae obtusely angulate, strongly protruding beyond eyes; epistome gibbose; frontal suture distinct. Pronotum very convex, broad, with large punctures irregularly and sparsely arranged, mixed with smaller, very thick but distinct punctures; microreticulation faint; anterior margin bordered only close to the front angles; sides strongly bordered, deeply sinuate up to the hind angles, these obtuse and well defined; base bisinuate, with no border but with a not much extended belt of coarse punctures, occasionally with a vestige of border at center. Scutellum large, faintly concave, sometimes with a slight median longitudinal feeble carina, irregularly punctured, strongly microreticulate, feebly sinuate at sides. Elytra convex, not very shining, subacute tooth present at sutural apex of each elytron as an extension of sutural edge; striae somewhat densely punctured, the punctures rather small, hardly crenulate; interstices nearly flat, thickly

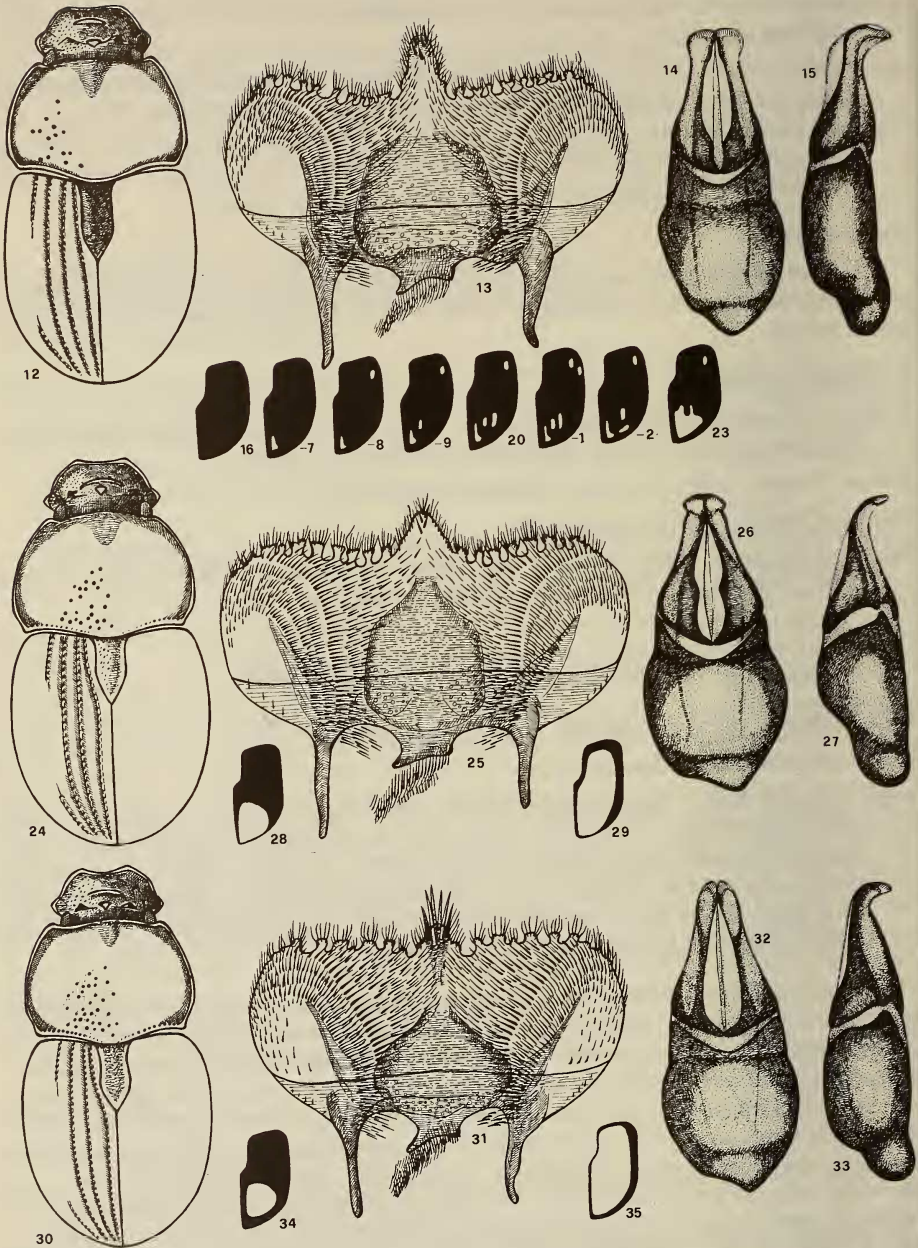


FIG. 12-35.

Figs. 12-23: *Aphodius (Teuchestes) brachysomus* Solsky (Ussurisk, Siberia).  
 Figs. 24-29: *Aphodius (Teuchestes) sinofraternus* sp. nov. (Fouchow, China).  
 Figs. 30-35: *Aphodius (Teuchestes) analis* (Fabr.) (Hong Kong).



punctured and finely microreticulate. Hind tarsi with the first segment approximately as long as the next three segments together. Male: frontal suture trituberculate; median tubercle conical, the lateral ones weak and transverse; pronotum with a feeble anterior median impression; fore-tibial spur somewhat narrow, not curved inwards, barely narrowed basally and slightly twisted (fig. 1); hind tibiae in lateral view flattened and enlarged, with a short subapical and oblique groove (fig. 9) upper spur of metatibia about as long as the next two segments together. Female: head with weak transverse tubercles; fore-tibial spur narrow and subparallel; pronotum without an anterior median impression; hind tibiae neither flattened, broadened nor prolonged; upper spur of metatibiae slightly narrower, slightly longer than the first segment of the metatarsi. Aedeagus figs.: 38-39. Epipharynx Fig.: 37. Length: 7-10,5 mm.

The species, *sensu lato*, is known from South and East Africa and Ethiopia.

### *Subspecies*

*scioensis* ssp. nov.

Locus typicus: Let Marefià (Scioa)

*A forma typica distinctus genis valde prominulis et angulatis, pronoto vage punctato.*

It differs from the typical form in more prominent and angulate genae and in the more scattered puncturation of pronotum.

In studying a rather numerous series of Ethiopian specimens we feel that there is sufficient ground to assign them the rank of subspecies.

### *Colour variations*

*forma typica*: Entirely black.

*parasorex* Landin: Elytra reddish, eventually epipleura, shoulder and a very narrow basal band black (fig. 40).

### *Confirmed Distribution*

— *caffer caffer*

SOUTH AFRICA: Frere, Natal (BM); Ulundi, Estcourt (BM); mouth of Umkomaas River (BM); Princetown (MM); Kranskop (MM); Thousand Hills (MM); Portnatal (MP); East London, Cape Prov. (MGE); Cape of Good Hope (MN).

ZAIRE: Kivu, Ibanda, Itombwe (MR).

— *caffer scioensis*

ETHIOPIA: Let Marefià (Scioa), VIII-XII-1878, Leg. Antinori (holotype, allotype & paratypes: Museo Civico di Storia Naturale, Genova).

Managasha (BM); Goulate, River Akaki (BM); Mt. Chillalo (BM); Wouramboulchi, Djem-Djem (BM, MP); Djem-Djem (MN); Mt. Gughé, Gamo Prov. (BM) (paratypes).

### *Aphodius dejeani* Har. (figs. 7, 45-48)

1862. *Aphodius dejeani* Harold, *Berl. ent. Z.* 6: 165.

Locus typicus: "Cap der guten Hoffnung".

Derivatio nominis: named in honor of the count Pierre François Marie Auguste Dejean, famous French entomologist.

*Valde convexus, brevis, nitidus, glaber. Niger, elytris apice late testaceis. Capite parvo; clypeo medio vix sinuato, lateribus rotundato, margine reflexo; genis parum prominulis; pronoto inaequaliter sparse punctato, antice haud marginato, basi marginato, tantum ante scutellum margine interrupto; scutello medio profunde sulcato; elytris crenato-striatis; interstitiis subconvexis, sparse punctulatis; maris tibiis anticis calcari deorsum incurvato, metatibiis haud compressis et dilatatis.*

Head small, very convex, with irregular subrugose and confused puncturation; clypeus feebly sinuate at middle, rounded at sides, front margin broad and upturned; genae rounded, barely more protruding than eyes; epistome gibbose with an anterior vestige of a transverse carina; frons trituberculate; frontal suture almost indistinct. Pronotum strongly convex, broad, sparsely punctured, largest punctures irregularly scattered, mixed with smaller and barely perceptible ones; microreticulation absent; front margin not bordered but, like the base with a belt of strong punctures; sides rounded and rather finely bordered, sinuate up to hind angles; latter obtusely sharpened; base almost completely bordered, the border missing adjacent to the scutellum. Scutellum much elongated, with a trace of angle near its apical third; sides flat; finely and regularly punctured; with a profound narrow median longitudinal groove along almost its entire length. Elytra shining, strongly convex, regularly rounded; striae distinctly crenulate; interstices slightly convex and very finely punctured, microreticulation almost absent. First segment of the metatarsi as long as the next four segments together, much longer than the superior tibial spur. Male: head trituberculate, the median tubercle large and conical, the lateral ones a little weaker; pronotum with a very feeble anterior median impression; fore-tibial spur subparallel at sides and apically a little narrowed (fig. 7); hind tibiae not enlarged. Female: frons with all three tubercles weaker but equally developed; pronotum more coarsely punctured; foretibial spur longer, acuminate and turned down apically. Aedeagus Figs.: 47-48. Epipharynx Fig. 46. Length 8 mm.

The species is now known from South Africa, Kenya, Zaire and Ethiopia, and seems to be a very rare one.

#### *Colour variations*

*forma typica*: black, elytra with almost the apical half yellowish, the front edges of this irregular, with a large dark fleck within it.

*impustulatus* Dellacasa, ab. nov.: *do.*, but the preapical dark fleck is missing; Ethiopia.

#### *Confirmed Distribution*

ETHIOPIA: no precise locality (MP).

KENYA: Mts. Aberdare (MGE).

ZAIRE: Lulua-Kapange (MGE).

SOUTH AFRICA: Cape of Good Hope (MN: lectotype; MP: 2 paralectotypes).

#### ***Aphodius sinofraternus* sp. nov. (figs. 3, 10, 24-29)**

*Locus typicus*: China

*Valde convexus, breviter ovatus, nitidus, glaber. Niger, interdum elytris macula magna apicis ferruginea vel fere omnino ferrugineis. Capite clypeo medio vix sinuato lateribus subanguloso; pronoto antice basique haud marginato, serie transversa basali punc-*

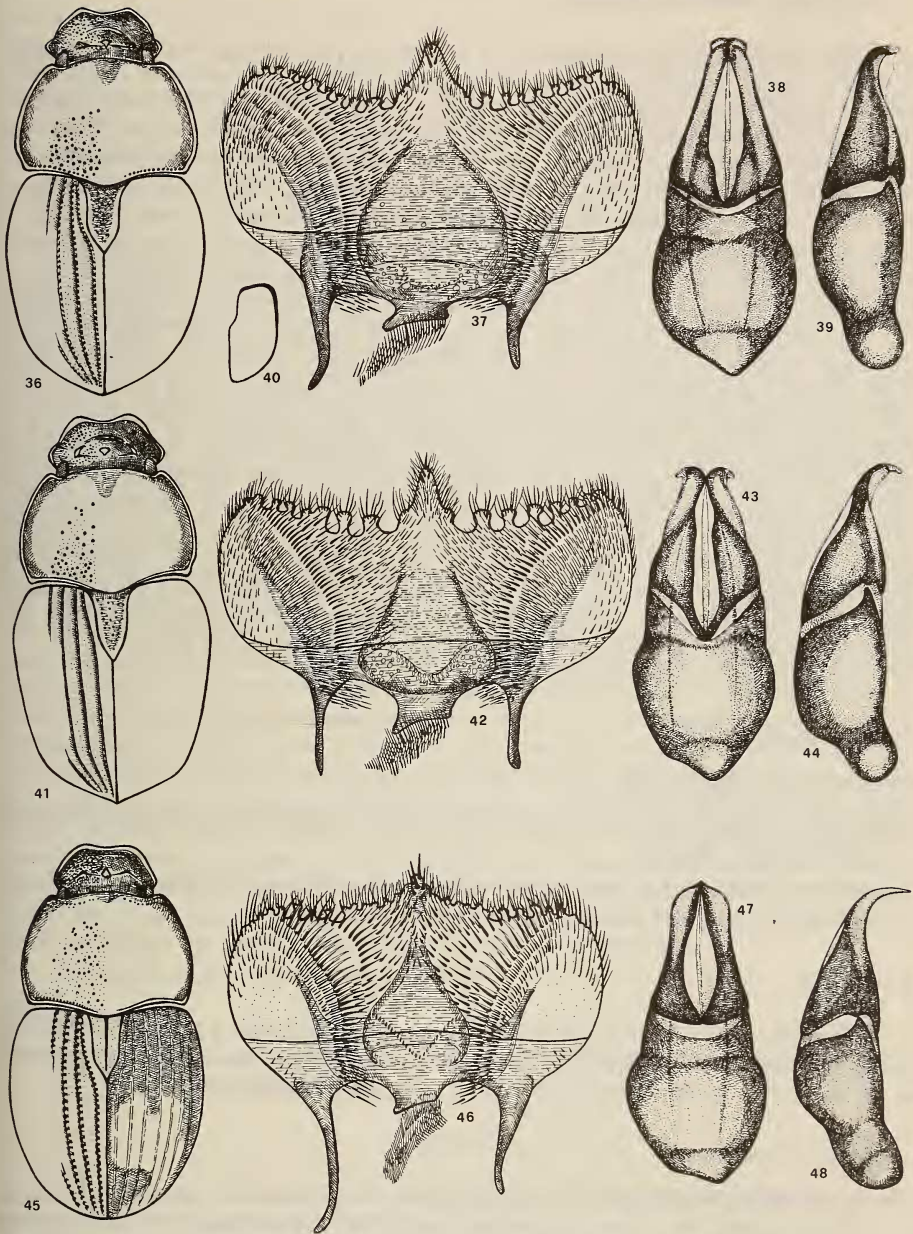


FIG. 36-48.

Figs. 36-40: *Aphodius (Teuchestes) caffer* Wied. (Kranskop, Natal).

Figs. 41-44: *Aphodius (Teuchestes) whicheri* sp. nov. (Inyazura, Rhodesia).

Figs. 45-48: *Aphodius (Teuchestes) dejeani* Har. (Cape of Good Hope).

*tuorum contiguorum tantum instructo; elytris subcrenato-striatis; interstitiis convexis; maris tibiis anticis calcari valde dilatato et deorsum incurvato, tibiis posticis compressis, apice valde dilatatis.*

Head convex, with fine, irregular and scattered puncturation, clypeus feebly sinuate at middle, rather angulate at sides, front margin narrow, not upturned except near anterior angles; genae obtusely angulate, more strongly protruding than eyes; epistome gibbose; frontal suture little distinct, only visible laterally; frons tuberculate. Pronotum very convex, broad, very irregularly and sparsely punctured, the large punctures mixed with smaller and obsolete ones, without microreticulation; anterior margin bordered near front angles only; sides strongly bordered, deeply sinuate up to the hind angles which are obtuse and well marked; base not bordered but with a belt of punctures usually well developed. Scutellum large, feebly concave; sides almost parallel in the basal half; moderately punctured and distinctly microreticulate. Elytra very convex, regularly rounded, very shining; striae not closely punctured, the punctures rather large, distinctly crenulate; interstices convex, very finely microreticulate, almost unpunctured. Hind tibiae with the upper spur longer than the first segment of metatarsi which is as long as the next three segments together. Male: frons trituberculate, median conical tubercle well developed, the lateral ones weak and transverse although distinct; clypeal transverse carina well marked; pronotum with a feeble anterior median impression; fore-tibial spur very broad and strongly curved inwards, somewhat proximally narrowed (fig. 3); hind tibiae flattened and strongly enlarged in the apical half, the outer face expanded rearwards, their subapical groove almost straight and complete (fig. 10). Female: frons with faint transverse tubercles; without an anterior median impression on pronotum; fore-tibial spur narrow and subparallel; hind tibiae neither flattened, broadened nor expanded. Aedeagus figs.: 26-27. Epipharynx fig. 25. Length 8-10,5 mm.

The species is only known from China.

#### *Colour variations*

*forma typica*: entirely black.

*pseudanalis* Dellacasa, ab. nov.: apical third of elytra reddish; first interstice and outer margin black (fig. 28).

*pseudosorex* Dellacasa, ab. nov.: elytra reddish with epipleura, shoulders, a rather narrow basal band and the first interstice black (fig. 29).

#### *Remarks*

Although closely allied to *analis*, *sinofraternus* appears quite a distinct species; ab. *pseudanalis* has a smaller reddish apical mark on the elytra, which is more apically bent at the sides than in the homologous colour variation of *analis*.

#### *Confirmed Distribution*

CHINA: no precise locality, ex coll. Horrell, mus. Hincks & Dibb, (holotype: ♀: MM). Ningpo (MM); N. China, no precise locality (BM); Chiu Kiang (BM); Chinkiang (MGE, MP); Foochow (MGE); Tatsienlu (MGE, MP) Kiautschau (MGE); Nanking (MP). (All paratypes)

*Aphodius whicheri* sp. nov. (figs. 2, 8, 41-44)

Locus typicus: Inyazura, Rhodesia.

Derivatio nominis: named in honor of Mr. L. S. Whicher, coleopterist of Newhaven.

*Valde convexus, brevis, glaber, nitidus. Niger. Capite clypeo medio distincte sinuato, lateribus fere rotundato; pronoto antice haud marginato, basi fere omnino marginato, ante scutellum sine margine tantum, disco sparse punctato; scutello omnino modice punctato; elytris punctato-striatis, interstitiis vix convexis, canthu apicali subdentiformi; maris tibiis posticis compressis, apice parum dilatatis.*

Head convex, with moderate and rather scattered puncturation, stronger anteriorly; clypeus completely bordered, the border narrow and only slightly upturned, distinctly sinuate at middle, rounded at sides; genae obtusely rounded, more protruding than eyes; epistome gibbose; frontal suture obsolete, vestigial at sides; frons tuberculate. Pronotum very convex, moderately broad, with large and irregularly scattered punctures, mixed with smaller and almost faint ones; microreticulate; anterior margin bordered at front angles only; sides strongly bordered, deeply sinuate up to the hind angles, these obtuse and quite marked; base bisinuate, almost completely bordered, except at middle adjacent to the scutellum. Scutellum large, subtriangular, with a faint angle at the middle of the sides; almost flat; very finely microreticulate and thus not shining; moderately and evenly punctured. Elytra convex, very shining, subamygdaliform, with sutural margin prolonged as a subacute tooth; striae not too closely punctured, the punctures small and little distinct, not crenulate, subcrenulate at the base only; interstices somewhat convex, with feeble and hardly visible microreticulation. Hind tibiae with upper apical spur longer than first segment of metatarsi which is as long as the next three segments together. Male: frons trituberculate, the median conical tubercule well developed, the lateral ones ridge-like and oblique, arranged as outer prolongations of the transverse epistomal carina which is quite marked; pronotum with a feeble anterior median impression; fore-tibial spur rather narrow and externally twisted (fig. 2); hind tibia in laterale view rather wide but otherwise relatively normal, with a short subapical and oblique groove (fig. 8); their upper spur about as long as the first two metatarsal segments together. Female: frons with weak tubercles; pronotum without an anterior median impression; fore-tibial spur narrow and subparallel; hind tibiae narrow and normal, their upper spur shorter than the first two tarsal segments together. Colour entirely black. Aedeagus figs. 43-44. Epipharynx fig. 42. Length 9-9,5 mm.

The species is only known from Zimbabwe.

*Distribution*

ZIMBABWE: Inyazura, 20.V.1950, leg. L. S. Whicher (holotype ♂); same locality, 7/22.V. 1950 (2 ♀ paratypes) (MM).

## RIASSUNTO

*Aphodius analis* e le specie vicine nel sottogenere *Teuchestes*, con descrizione di due nuove specie (*Coleoptera Scarabaeidae: Aphodiinae*).

Gli autori, studiando criticamente materiale abbastanza cospicuo proveniente da numerose regioni, concludono che nel gruppo dell'*Aphodius analis* sono compresi quattro taxa ben distinti a livello specifico e dei quali due sono nuovi: *A. sinofraternus* della Cina e *A. whicheri* della Rhodesia.

L'esame dell'epifaringe e dell'edeago delle sei specie studiate conferma l'omogeneità del sottogenere *Teuchestes* inteso qui restrittivamente nel senso di Dellacasa (1983) e che, con la specie tipo (*A. fossor*), comprende attualmente sette specie.

## LITERATURE CITED

- BALTHASAR, V. 1955. Scarabaeidae der Afghanistan-Expedition (1952-53) J. Klapperichs. *Acta ent. Mus. natn. Pragae* 30: 409-439.
- 1964. Monographie der Scarabaeidae und Aphodiidae der palaearktischen und orientalischen Region. Coleoptera Lamellicornia. Bd. 3. Aphodiidae. *Prague*.
- DELLACASA, G. 1983. Sistematica e nomenclatura degli Aphodiini italiani. In press.
- ENDRODI, S. 1976. Neue Aphodiinae aus Süd- und Ostafrika. *Ann. Transv. Mus.* 30: 109-118.
- FABRICIUS, J. C. 1787. Mantissa Insectorum sistens eorum species nuper detectas adjectis characteribus genericis, differentis specificis, emendationibus, observationibus. *Hafniae*.
- 1792. Entomologia systematica emendata et aucta. Secundum classes, ordines, genera, species adjectis synonymis, locis, observationibus, descriptionibus. *Hafniae*.
- HAROLD, E. von, 1862. Beiträge zur Kenntniss einiger coprophagen Lamellicornien (Drittes Stück). *Berl. ent. Z.* 6: 138-171.
- JACOBSON, G. 1897. *Aphodius troitzkyi* n. sp. *Horae Soc. ent. ross.* 31: 87-89.
- LANDIN, B.-O. 1974. Taxonomic studies on African Aphodiini. II. *Entomologica scand.* 5: 233-239.
- LINNE, C. von, 1758. Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Ed. X, reformata; T.I. *Holmiae*.
- MADER, L. 1938. Neue Coleopteren aus China und Japan nebst Notizen. *Ent. NachrBl., Wien* 12(1): 46-61 (56-57).
- 1953. Die Formen der paläarktischen Aphodiinae. *Ent. NachrBl., Wien* 5: 55-56 (partem).
- NICOLAJEV, G. V. 1979. Novye i redkie vidy Platinčatousykh fauny primorscogo kraja. In: Zhuky dal'nego vostoka i vostočnoj Sibiri. A.N.S.S.R., dal'nevostočni naučni zetr. *Vladivostok* (99-101).
- PETROVITZ, R. 1955. The third Danish Expedition to Central Asia. Zool. Res. 18; Scarabaeidae aus Afghanistan. *Vidensk. Meddr. dansk naturh. Foren.* 117: 275-287.
- SCHMIDT, A. 1913. Erster Versuch eine Einteilung der exotischen Aphodien in Subgenera und als Anhang einige Neuebeschreibungen. *Archiv. f. Naturg., Berlin*, 79 A 11: 117-178 (Register, ibidem, 1914: 203-212).
- SOLSKY, M. S. de, 1874. Description d'une espèce nouvelle du genre Aphodius. *Col. Hefte, München*, 12: 13-14.
- STEBNICKA, Z. 1973. Neue Scarabaeidenarten aus der koreanischen Volksdemokratischen Republik. *Bull. Acad. Pol. Sci., Warszawa*, 21: 117-121.
- WATERHOUSE, C. O. 1875. On the Lamellicorn Coleoptera of Japan. *Trans. ent. Soc. Lond.* 24: 71-116.
- WIEDEMANN, C. R. W. 1823. Zweihundert neue Käfer von Java, Bengalen und dem Vorgebirge der guten Hoffnung. *Zool. Mag., Kiel*, 2: 1-135.